Fermilab Today

Thursday, April 12, 2007

Calendar

Thurs., April 12
THERE WILL BE NO ALCPG ILC PHYSICS AND DETECTOR SEMINAR THIS WEEK
THERE WILL BE NO THEORETICAL PHYSICS SEMINAR THIS WEEK
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over
4:00 p.m.
Accelerator Physics and Technology Seminar - 1 West
Speaker: M. Ross, Fermilab
Title: Status/Plans for Technical Division

Fri., April 13
3:30 p.m.
DIRECTOR'S COFFEE BREAK - 2nd Flr X-Over **4:00 p.m.**
Joint Experimental-Theoretical Physics Seminar - 1 West
Speaker: K. Desch, University of Bonn
Title: LHC ILC Interplay

Click here for NALCAL, a weekly calendar with links to additional information.

Weather

Chance of snow
39°/29°

Extended Forecast
Weather at Fermilab

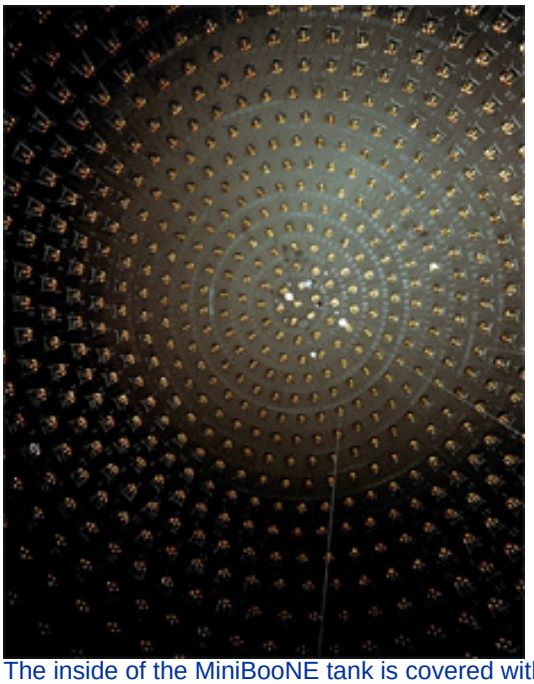
Current Security Status

Secon Level 3

Wilson Hall Cafe

Feature

MiniBooNE opens the box



The inside of the MiniBooNE tank is covered with 1280 inward-facing photomultiplier tubes. The picture shows a section of the upper hemisphere of the tank.

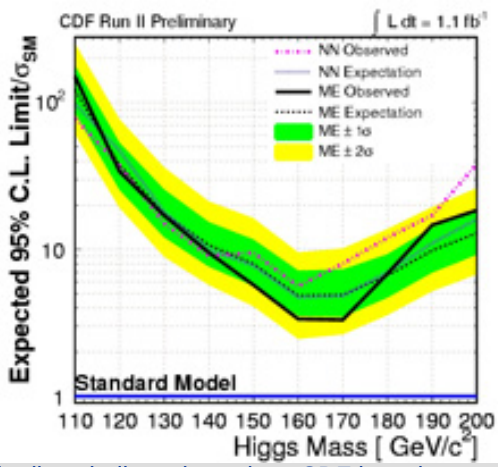
Scientists at Fermilab today announced their first findings from the MiniBooNE experiment. The MiniBooNE results resolve questions raised by observations of the LSND experiment in the 1990s that appeared to contradict findings of other neutrino experiments worldwide. MiniBooNE researchers showed conclusively that the LSND results could not be due to simple neutrino oscillation, a phenomenon in which one type of neutrino transforms into another type and back again.

The announcement significantly clarifies the overall picture of how neutrinos behave.

Currently, three types or "flavors" of neutrinos are known to exist: electron neutrinos, muon neutrinos and tau neutrinos. In the last 10 years, several experiments have shown that neutrinos can oscillate from one flavor to another and back. The observations made by the LSND collaboration also suggested the presence of neutrino oscillation, but in a neutrino mass region vastly different from other experiments. Reconciling the LSND observations with the oscillation results of

Fermilab Result of the Week

CDF lowers the roof on Higgs



The lines indicate how close CDF is to the expected Standard Model Higgs cross-section for the analyses featured in this article. At a Higgs mass of 160 GeV/c^2 they are only a factor of about 4 from the Standard Model. (see below for more)

The search for the Higgs boson, the "missing piece" in the Standard Model of elementary particles which is thought to be responsible for giving the particles mass, is being pursued on all fronts at the Tevatron. The expected Higgs signal is small, and its detection amidst relatively large background processes that can mimic this signal, requires sophisticated statistical methods. CDF physicists have recently released two further analyses that look for this elusive particle.

The analyses search for the Higgs boson decaying into two W particles, which are carriers of the electroweak force. The unstable W's are observed by their decay into an electron or muon together with an unobserved neutrino. The neutrino results in missing energy in the detector which helps identify the process. The H --> WW process is the most effective for finding a Higgs boson with mass greater than about 140 GeV/c^2 (150 times the proton mass).

CDF uses two innovative approaches to search for the Higgs. In technical terms, one is an "artificial neural network" trained to distinguish Higgs events from background, and one is a "matrix element" analysis formed from theoretical probabilities combined with detector modeling. The two analysis techniques have similar reach, but different

Thursday, April 12
-Tomato florentine
-Grilled chicken Cordon Bleu sandwich
-Chimichangas
-Smart Cuisine chicken marsala
-Smoked turkey melt
-Assorted sliced pizza
-SW chicken salad w/roasted corn salsa

Wilson Hall Cafe Menu

Chez Leon

Thursday, April 12
Dinner
- Vol-au-vents w/ mushroom duxelle
- Asian BBQ lamb chops
- Rice pilaf
- Spinach w/ pine nuts & lemon zest
- Lemon napoleon

Wednesday, April 18
Lunch
-Southwest Cornish hens
-Chipotle sweet potatoes
-Vegetable of the season
-Poached pears w/ raspberry sauce

Chez Leon Menu
Call x4598 to make your reservation.

Archives

Info

Fermilab Today is online at:
www.fnal.gov/today/

Send comments and suggestions to:
today@fnal.gov

other neutrino experiments would have required the presence of a fourth, or "sterile" type of neutrino, with properties different from the three standard neutrinos. The existence of sterile neutrinos would throw serious doubt on the current structure of particle physics, known as the Standard Model of Particles and Forces. Because of the far-reaching consequences of this interpretation, the LSND findings cried out for independent verification.

Read More

Feature

Best of Dance Chicago

Chicago's best dancers will take the stage Saturday night in Best of Dance Chicago, in Ramsey Auditorium.

The Best of Dance Chicago's kaleidoscope of movement slides into Fermilab with the city's best performers and choreographers, and with masters of contemporary ballet, tap, hip hop, modern, ethnic and ballroom styles set to entertain Saturday, April 14 at 8 p.m. in Wilson Hall's Ramsey Auditorium.

Curator John Schmitz, Founder of the Dance Chicago Festival, will present Thodos Dance Chicago, Chicago Tap Theatre, M.A.D.D., State Street Dance Company HipHop ConnXions, some ballroom by Erwin and Iwona, SurTaal, Stick and Move Dance Crew, Eddy Ocampo, Elements Contemporary Ballet and live music by Stone.

"This will be an absolutely terrific program with dance for any taste," said Janet MacKay-Galbraith, performing arts program manager for the Fermilab Arts & Lecture Series. "I think it's going to be a pretty exciting experience for families as well as anyone who loves dance. Though we've traditionally produced Choreographer's Showcases, we've never had this many dance companies performing on our stage in one evening, so there's sure to be something for everyone."

The event starts at 8 p.m. in Ramsey Auditorium. Tickets at the Wilson Hall box office are $20 for adults and $10 for ages 18 and under. For more information or tickets, call 630-840-ARTS (2787) or visit the Fermilab Culture web site

strengths, and so a future combination of the two should be even better. When compared to previous, less sophisticated approaches, these analyses improve as if they had 50 percent more data.

The results show that we're closing in on the Standard Model Higgs boson --especially if its mass is close to 160 GeV/c^2! Combined with the many other Higgs searches at CDF and D0, and the increasing Tevatron luminosity, there is a sporting chance that Fermilab might just be the first to discover the Higgs.

Learn more

Above graphic: Confidence level limits (at 95 percent CL) of the production cross-section of Higgs bosons with subsequent decay to a pair of W's, as a ratio to the Standard Model expected cross-section. "NN" stands for the Neural Network approach, "ME" stands for the Matrix Element approach. A merging of these two analysis techniques is presently underway which will further improve CDF's sensitivity to a possible Higgs signal.

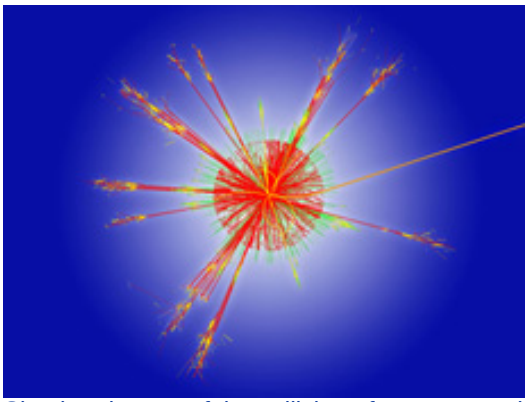
Top from left: Mark Neubauer, Shih-Chieh Hsu, with screens of Elliot Lipeles, Frank Wurthwein, Rami Vanguri (all from UC San Diego). Middle : Toby Davies, Rick St. Denis, Stan Thompson, Aidan Robson, (Glasgow). Bottom: Valentin Necula (Duke), Peter Bussey (Glasgow), and Mark Kruse, Dean Hidas, Doug Benjamin (Duke).

Accelerator Update

-- Kate Raiford

From iSGTW

GridPP: the UK Grid for Particle Physics



Simulated event of the collision of two protons in the ATLAS particle physics experiment. *Image courtesy of CERN*

Particle physicists in the United Kingdom have built the country's largest grid as part of the GridPP project. Developed to analyze data from the upcoming Large Hadron Collider at CERN, the grid currently spans 17 UK sites and includes almost 10,000 CPUs and more than 500 terabytes of data storage, with available storage reserves on disk and tape of 1.5 petabytes. It is also an integral part of the Enabling Grids for E-sciencE project, contributing most of the computing power for the UK and Ireland regions.

Read More

April 9-11
- TeV A2 wet engine required repair
- MiniBooNE pulsed its horn
- Linac suffers many LRF2 trips
- MiniBooNE resumes taking beam
- Accumulator kicker problems
- MTest (T964) completes its run
- ComEd power glitch aborts store 5345

Read the Current Accelerator Update
Read the Early Bird Report
View the Tevatron Luminosity Charts

In the News

The New York Times
April 12, 2007:

How Did the Universe Survive the Big Bang? In This Experiment, Clues Remain Elusive

An experiment that some hoped would reveal a new class of subatomic particles, and perhaps even point to clues about why the universe exists at all, has instead produced a first round of results that are mysteriously inconclusive.

"It's intellectually interesting what we got," said Janet M. Conrad, professor of physics at Columbia University and a spokeswoman for a collaboration that involves 77 scientists at 17 institutions. "We have to figure out what it is."

Read More

Announcements

MS Project 2003 Class
A MS Project 2003 class is scheduled for Tuesdays, May 1st and 8th Learn to create and modify a project plan file that contains tasks, resources, and resource assignments. Learn more and enroll

Multi-media art show
Richard Meaderdes, an employee in Fermilab's Communications Center, will have his paintings, photographs and drawings on display at the Messenger Public Library in North Aurora from April 11 thru May. For information on library hours or location, call (630) 896-0240 or visit the library web site.